

MARSHALL STAR

Serving the Marshall Space Flight Center Community

April 1, 2010

First Saturn booster tests conducted 50 years ago in Huntsville

By Mike Wright

In 1951, Dr. Wernher von Braun liked to tell after-dinner audiences that an American space vehicle could be developed from the U.S. Army's missile and rocket programs then in progress in Huntsville. "Public reaction was one of interest and excitement colored by an element of disbelief," according to the Redstone Rocket newspaper in Huntsville, serving Redstone Arsenal.

Nevertheless, von Braun – who eventually became director of the Development Operations Division for the Army Ballistic Missile Agency in Huntsville and, in 1960, the first director of the Marshall Space Flight Center – spread his message far and



See Saturn on page 5 A static firing of the Saturn first stage

Shuttle Discovery set to launch April 5 for STS-131 mission

From a NASA news release

Space shuttle Discovery is scheduled to begin a 13-day flight to the International Space Station with launch April 5 at 5:21 a.m. CDT from the Kennedy Space Center, Fla.



Discovery's launch date for the STS-131 mission was announced March 26 at the conclusion of a flight readiness review at Kennedy. During the meeting, senior NASA and contractor managers assessed the risks associated with the mission and determined the shuttle's equipment, support systems and procedures are ready for the mission.

STS-131 is the second of five shuttle missions planned for 2010, with the last flight targeted for a September launch.

Discovery will deliver science experiments, equipment and supplies to the

See STS-131 on page 3

New eye on station will enable additional Earth science

By Janet Anderson

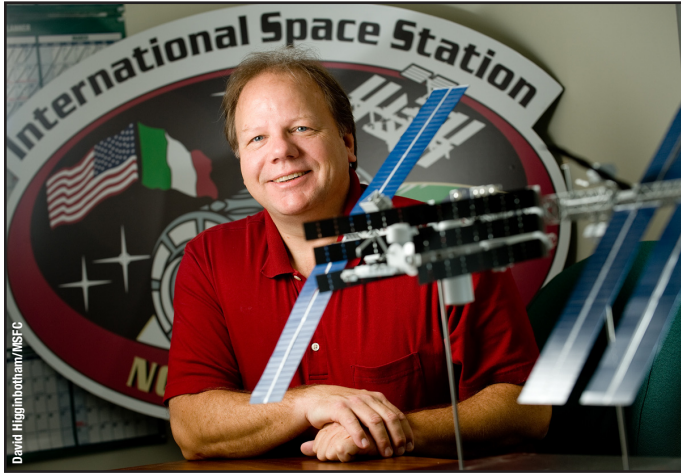
The International Space Station will become an eye in space to keep watch on the Earth with the addition of a new Earth science observatory rack. The Window Observational Research Facility, or WORF, will help space station crews capture some of the most detailed images ever from an orbiting spacecraft.

WORF was manufactured and tested at the Marshall Space Flight Center. It

See WOLF on page 3

THE FACE OF MISSION SUCCESS IS: Steve Pavelitz

Project engineer, Node Integration Office



- **Organization:** Science & Mission Systems Office
- **Joined NASA:** 2000
- **Education:** Bachelor's degree in aerospace engineering, Penn State University, University Park, Pa., 1982
- **Responsibilities:** My job is to coordinate interface issues and configuration changes of Node 3, along with working closure of requirements. I help resolve technical issues and any other work needed to complete the integration, flight processing, launch and activation. Nodes are interconnecting elements between the various pressurized modules on the International Space Station, allowing passage of crew members and equipment to other station elements, while also providing vital functions and resources.
- **What role did you play in the installation of the Node 3 on STS-130?** I supported the assessment and design changes of the ammonia lines connecting Node 3 to the U.S. Laboratory Module. I was on console in the Mission Evaluation Room at the Johnson Space Center in Houston during the STS-130 mission to provide assistance needed to the space station system teams.
- **How do you hope to contribute to Marshall's future goals?** I have gained a lot of experience from working the design, manufacture, integration and launch of Node 2 and Node 3. I hope to be able to apply that knowledge on another flight project as either chief engineer or project manager.

Marshall's Earth Day theme is 'Reducing Our Carbon Footprint'

By Malene McElroy

This year's Earth Day theme, "Reducing Our Carbon Footprint," was chosen because federal agencies are required to comply with several environmental regulations and executive orders that will help the federal government become more sustainable by reducing its carbon footprint.

The Marshall Space Flight Center will celebrate Earth Day on April 22. The April 15 Marshall Star will include details of the festivities planned for that day.

A carbon footprint is a measure of the impact human activities have on the environment, and in particular climate change. It relates to the amount of greenhouse gases produced in day-to-day lives through burning fossil fuels for electricity, heating, transportation, etc.

All federal agencies are required by the following rules and regulations to operate in an increasingly sustainable manner:

- Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S.C. 6962)
- Farm Security and Rural Investment Act of 2002 (7 U.S.C. 8102(c)(3))
- Executive Order 13423, "Strengthening Federal, Environmental, Energy, and Transportation Management", dated Jan. 24, 2007
- Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance", dated Oct. 5, 2009



A sustainable organization meets human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. The carbon footprint provides organizations a standard to compare the sustainability of one process to another. For example, the average North American generates about 20 tons of carbon dioxide each year while the global average carbon footprint is about 4 tons of carbon dioxide per year.

To ensure that future generations have adequate resources, Marshall team members need to reduce their carbon footprint. These federal regulations and executive orders require Marshall to purchase goods that are water/energy efficient, contain recycled content, biodegradable, less toxic and/or otherwise environmentally friendly. The center is required to reduce the amount of waste produced by recycling and using fewer resources.

McElroy is an environmental engineer in the Environmental Engineering & Occupational Health Office in the Office of Center Operations.

WORF *Continued from page 1*

is scheduled for launch aboard space shuttle Discovery on STS-131, targeted for launch April 5 from Kennedy Space Center, Fla. WORF was originally planned for launch in 2003; however it was delayed due to the space shuttle Columbia accident.

WORF is designed to make the best possible use of the high-quality research window in the space station's U.S. Destiny Laboratory module. The Earth observation window is made of the highest quality optics ever flown in a human occupied spacecraft. The window is 20 inches in diameter.

In order to make full use of the window, a hardware system to mount payloads in front of the window was needed.

Marshall engineers proposed a derivative of the Expedite the Processing of Experiments to Space Station – or EXPRESS – experiment rack already in use on the station and they were given approval to proceed with developing the rack. The EXPRESS rack provides room for a variety of experiments and power, communications, data and other utilities needed for Earth-observing equipment.

The rack, which is about the size of a refrigerator,



The Window Observational Research Facility Rack, or WORF, will provide valuable resources for Earth science payloads and will protect the U.S. Destiny Laboratory module's window.

can accommodate payloads with maximum dimensions of 21 inches wide by 20 inches deep and 30 inches long. The interior of the rack is sealed against light and coated with a special low-reflective black paint so payloads will be able to observe low-light-level subjects, such as the Northern Lights around Earth's poles and the faint glow of auroras.

Payloads in WORF will focus on geology, agriculture, and environmental and coastal changes. Cameras and remote sensing instruments in WORF can be controlled from the ground or operated by station crew members.

Installation of WORF in the Destiny laboratory is scheduled this month.

Earth observation experiments taking place in WORF and all other science research operations on the space station are managed by the Payload Operations Center at Marshall. The Marshall Center is a primary manufacturing facility responsible for design and construction of critical space station components, such as the WORF.

Anderson is a public affairs officer in the Office of Strategic Analysis & Communications.

STS-131 *Continued from page 1*

space station, including a multipurpose logistics module filled with science racks managed by the Marshall Space Flight Center. Known as the Window Observational Research Facility, or WORF, the module provides a facility for Earth science remote-sensing instruments using the Destiny science window. WORF includes the highest-quality optics ever flown on a human-occupied spacecraft.

Discovery's visit to the space station will include three spacewalks to

install a spare ammonia storage tank and return a used one; retrieve a Japanese experiment from the station's exterior; and switch out a gyroscope assembly on the truss, or backbone of the orbiting research center. The gyroscope assembly is an electronics box that helps the space station determine and maintain its flight attitude in orbit.

Commander Alan Poindexter will be joined on the mission by Pilot Jim Dutton and Mission Specialists

Rick Mastracchio, Dottie Metcalf-Lindenburger, Stephanie Wilson, Clay Anderson and Japan Aerospace Exploration Agency astronaut Naoko Yamazaki. This mission is the first trip into space for Dutton, Lindenburger and Yamazaki.

STS-131 will be Discovery's 38th mission and the 33rd shuttle flight dedicated to station assembly and maintenance. For more information about STS-131, visit <http://www.nasa.gov/shuttle>.

CFC team honors Marshall contributors



The Combined Federal Campaign organizing committee at the Marshall Space Flight Center recently held a luncheon to honor individuals and teams who contributed to the success of the 2009 federal fundraising effort. Among those recognized were Lee Ballew, left, a courier in the Office of Human Capital, who accepted his "Going the Extra Mile" plaque from Center Director Robert Lightfoot for exceptional contributions to the campaign. The luncheon also recognized Marshall organizations that surpassed last year's center-level average gift by the largest percentage, based on per capita contributions. The winning team, the Systems Engineering & Integration Branch of the Engineering Directorate's Space Systems Department, will be treated to a team meal with Lightfoot. The center director also will record a video blog from the branch's offices. Collectively, Marshall Center team members raised \$710,399 for the CFC in 2009.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, April 8, is 4:30 p.m. Thursday, April 1.

Miscellaneous

- 1990 Williams Funhouse pinball machine, \$2,100. 830-1139
- Solid oak entertainment chest, storage, shelves, \$150, call for pictures. 617-9614
- Writing desk and hutch, chair, all for \$150. 479-4926
- Pier One furniture, media stand, coffee table, desk, hi-top table, bar stools, \$50-\$125. 468-6016
- Sherrill sofa, three cushion, gold, blue, black, green, burgundy wide-flame stitch, photos available, \$100. 651-5570

- Twin mattress, \$75. 832-978-7128
- 360 games, Grand Theft Auto IV, Prototype, Armored Core, Assassin's Creed II, \$30 each. 777-7746
- Youth alloy ball bats, worth 18oz/28in, LS 20oz/28in, \$15 each. 651-5847
- CKC Yorkie, home raised, ready, female, small toy size, \$700. 425-8381
- Set of Syracuse china, sterling flatware with tarnish-proof chest, \$1,000 for both. 883-1096
- Body Solid home gym, straight bar, curl bar, bench, free weights, other machines, \$750. 895-8294
- All American 24-foot aluminum extension ladder, 200-pound capacity, Type 3, \$100. 655-6348
- Electrical wire, 8-2 with ground (40 amp), approximately 83 feet, \$70. 880-6544
- Playstation 3 game, Little BIG Planet, Game of the Year edition, rated E, \$40. 828-1234

Vehicles

- 2006 Toyota Tundra SR5 double cab, 50k miles, black, tan

- cloth interior, \$19,000. 509-9431
- 2004 BMW 330Ci with performance package, 32,400 miles, \$20,700. 508-2218
- 2000 Honda XR 70cc dirt bike, Alpinestars boots, mens size 8. \$450 obo. 971-3027
- 1999 Acura TL, silver, leather, loaded, 167k miles, \$4,900. 682-6327
- 1985 BMW Motorcycle K100RT, 1,000 cc fuel injection, \$1,950 obo. 302-6783

Wanted

- P90X workout DVDs and equipment. 704-754-2249
- Houses/offices to clean, available evenings and weekends. 777-8595 leave message
- Golden Retriever pup. 325-6000
- Weekly house cleaning, some ironing and light cooking in Madison. 464-8933

Found

- SCALA gray hat, Building 4200/G13, March 22. 544-4680
- Silver necklace with pendant. 694-0880

wide to audiences, and even to a few congregations.

Now, more than 50 years have passed since sight of the smoke and the sound of thunder near the banks of the Tennessee River turned space program skeptics to converts.

On March 28, 1960, the first limited Saturn static firing was conducted involving two engines. On April 6, 1960, at 11:15 a.m., four of the eight rocket engines of the first Saturn space booster were static fired in the area now known as the Marshall Center East Test Area. The firings in March and April culminated nine years later on July 16, 1969, when an even more powerful Saturn rocket – the Saturn V – launched humans on their first journey to the lunar surface. Today, that Saturn V launch and Apollo 11 lunar landing stand as one of the all-time highpoints in the 50 years of service to the nation that Marshall marks this year.

Less remembered than Apollo 11 are those first static tests of a Saturn booster in March and April 1960. Both firings were very short duration firings. During the April 6 firing, over 600,000 pounds of thrust was developed. “The test occurred on the test tower of the Army Ballistic Missile Agency. This test facility will become a part of the Marshall Space Flight Center of the National Aeronautics and Space Administration on July 1, 1960,” the Redstone Rocket reported after the firing.

(To read more about the U.S. Army's early contributions involving the space program in Huntsville, view the 1950 and 1960 volumes of the Redstone Rocket recently published online at www.redstone.army.mil/history/rockets, courtesy of the command historian for the U.S. Army Aviation & Missile Life Cycle Management Command.)

The firings occurred between March 15, 1960, when President Dwight Eisenhower officially designated the Huntsville facility as the NASA George C. Marshall Space Flight Center, and July 1, 1960, when the center officially opened for business. The president's proclamation came as the 60-day limit on congressional disapproval expired, clearing the way for actual transfer of the von Braun team July 1 from the Army.

U.S. Army Gen. George C. Marshall was the World War II army chief of staff and later served as U.S. secretary of state. Marshall's widow, Katherine Marshall, and Dr. T. Keith Glennan, NASA's first administrator, were present at the White House when Eisenhower signed an executive order naming the Huntsville NASA facility.

Under provisions of the National Space Act, the transfer was due to become official, but not effective, 60 days after the move was presented to Congress. Barring objections by Congress, the transfer was to take place automatically. In March 1960, the U.S. House of Representatives, as an indication of its confidence of the move, passed a resolution

that would have removed any question of transfer. The Senate, however, did not vote on the resolution, partly as a result of the legislative logjam over civil rights.

In March 1960, the Redstone Rocket captioned a photograph: “Army Ballistic Missile Agency personnel ‘walk’ the first Saturn booster en-route to the agency's test laboratory for its initial static test firing. Saturn is a program of the National Aeronautics and Space Administration.”

The trailer used to transfer the booster also served as the base of the fixture on which the giant rocket was assembled. The 80-foot-long, 22-foot-diameter space booster – too large to be

transported by plane, rail or highway – would be carried to its coastal launching site at Cape Canaveral, Fla., by a specially built barge, the newspaper said. “Scheduled for operation by the 1962-1963 time period, the Saturn will provide the United States with an efficient and reliable heavy lift vehicle capable of lifting multi-ton loads into high orbit around the earth and

“The [Saturn booster] test occurred on the test tower of the Army Ballistic Missile Agency. This test facility will become a part of the Marshall Space Flight Center of the National Aeronautics and Space Administration on July 1, 1960.”

— Redstone Rocket

into deep space,” the newspaper reported at the time.

Giant cranes lifted the booster into position in the static test tower, which is recognized today as a National Historic Landmark. The tremendous forces developed by the booster's thrust in the tower were held by massive concrete foundations resting on heavy piling driven into bedrock. “Vertical loads were carried from the anchored booster through a restraining and measuring system to girders built into a load platform connected to corner columns secured to the foundations,” the Redstone Rocket reported.

The Saturn booster included eight H-1 liquid propellant engines installed in the tail section. Total thrust of the clustered engines was equivalent to 30 million horsepower. The giant booster consisted of eight, 70-inch-diameter liquid oxygen and kerosene fuel tanks clustered around a 105-inch-diameter liquid oxygen tank.

On March 30, 1960, the Redstone Rocket reported that the Army had conducted exhaustive studies to determine how much noise the giant Saturn would create when it was static fired for the first time at Redstone Arsenal. Maj. Gen. August Schomburg, commanding the Army Ordnance Missile Command, said studies had shown that the Saturn tests could make sounds without harmful effects – “either to people, to pastures on the arsenal or to property.”

The general did not issue any official comment regarding the impact that first booster test in 1960 or the first actual launch of a Saturn in 1961 may have had on those who may have dined locally or nationally with von Braun in 1951.

Wright is the Marshall Center historian in the Office of Strategic Analysis & Communications.

Ready to race!



Huntsville Center for Technology students Sarah Folse, left, and Jamensky Scott show they're ready to roll at a regional moonbuggy invitational hosted by their school in March. Also participating in the event – a prelude to NASA's 17th annual Great Moonbuggy Race – were racers from Madison County Career Technical Center in Huntsville and Arab High School in Arab, Ala. The teams compared buggy designs, shared racing tips and pedaled around the Center for Technology's

test track. The Great Moonbuggy Race, organized each year by the Marshall Space Flight Center, will be held April 9-10 at the U.S. Space & Rocket Center in Huntsville. More than 100 high school, college and university teams from around the world are registered to compete, and will pit lightweight vehicles of their own design against a simulated lunar landscape. For more information, visit <http://moonbuggy.msfc.nasa.gov>.

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